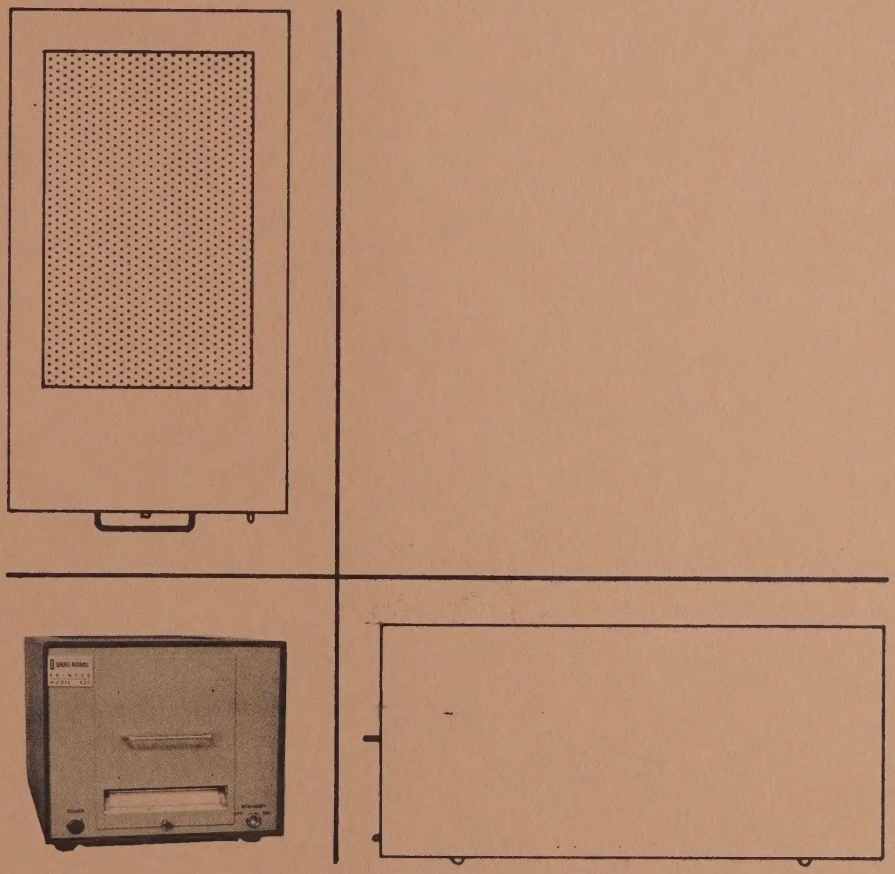
INSTRUCTION MANUAL

STORES NUMBER 32924

PRINTER Model 620



BAIRD-ATOMIC

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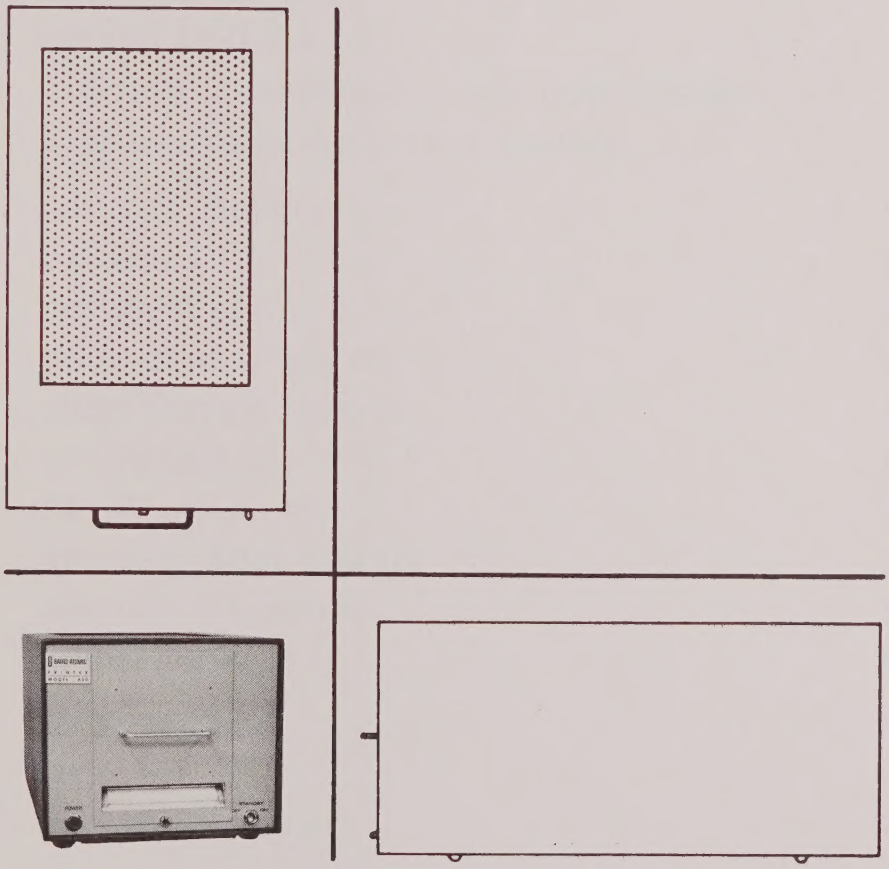
INSTRUCTION MANUAL

PRINTER Model 620



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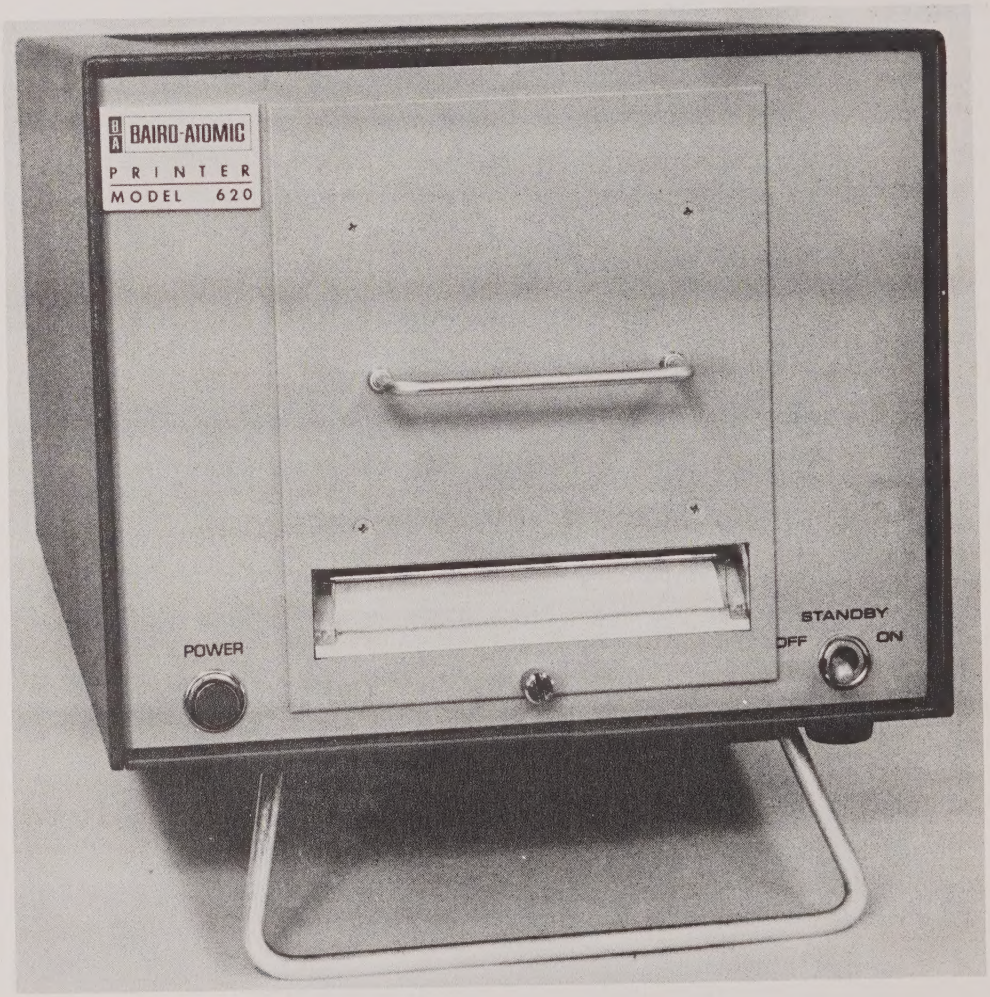

Frontispiece. Model 620 Printer

SECTION I

GENERAL DESCRIPTION

PRINTER DEFINITION

The Model 620 Printer is a solid-state parallel printer designed to operate as a readout device for a wide variety of instruments. The standard models can print 6, 11, or 12 digits in a line at a maximum printing speed of 2 lines per second. The printer directly accepts 4-line BCD input data in 1-2-4-8 code.

A multiplex mode in which 2 sets of up to 12 inputs each may be simultaneously connected to the printer is a key feature offered with the Model 620 Printer. With the application of an external print command, the two sets of inputs are printed on sequential lines. The numerals 1 and 2 are printed in the 14th column (the column to the extreme left) to identify the inputs. Two of the standard models contain this feature, and it is available as an option in the other models.

The standard printers are factory-wired to accept input signal levels of 0 ± 0.5 to -6 volts, binary zero being more negative than binary one. At his option, however, an operator may use other levels, provided the binary zero is either open-circuited or does not exceed -9 volts. Under all conditions binary zero must be more negative than binary one by at least 6 volts.

The mechanical arrangement affords a compact assembly consistent with the Baird-Atomic half module series of instruments. The low voltage supply is mounted on the rear deck, with the printed circuit cards on either side of the printer mechanism housing. The mechanism is easily removed from the front of the cabinet to facilitate paper tape and ribbon changes. A 22-pin connector carries the appropriate signals between the mechanism and the main chassis. The individual count modules for each column of print are easily accessible and can be removed without unsoldering.

PRINTER SPECIFICATIONS

Since Baird-Atomic products benefit from a program of continuing evaluation and improvement, specifications are subject to modification.

Column Capacity	12 digits maximum (see figure 1)
Numerical Printout	0 through 9
Printing Rate	2 lines per second, maximum
Input Code	4-line BCD, 1-2-4-8 code
Input Levels	Binary one, 0 ± 0.5 volt Binary zero, open-circuit or -6 to -9 volts (For additional data refer to OPTIONAL INPUT LEVELS, page 2.)

Input Load	100,000 ohms to -9 volts
Print Command	Command necessary from external device to start print cycle; requirements are -6-volt negative-going pulse from ground, 1 microsecond maximum fall time, 5 microseconds minimum pulse width; load 2400 ohms to ground
Inhibit Start	Command generated by printer to be used for preventing input data change in external device during setup time of printer; nominal -6-volt level goes to 0 ± 0.5 volt upon receipt of print command and returns to negative level 200 milliseconds after print command; maximum load 5 milliamperes maximum to negative supply.
Printing Ribbon	5/16 inch, black
Paper	4-inch roll tape
Power Requirements	Standard: 95 to 130 volts ac at 60 hertz, approximately 0.4 ampere Options: 95 to 130 volts ac at 50 hertz 195 to 255 volts ac at 50 hertz
Ambient Temperature Range	+10° to +50°C
Dimensions	8-1/2 in. wide x 7 in. high x 15 in. deep
Weight	Approximately 31 pounds
Cables	See chart on figure 7

OPTIONAL MULTIPLEX MODE

With the multiplex option, 2 sets of 12 inputs each may be connected to the printer at the same time. Two successive print cycles are initiated upon receipt of each print command, with the standard set of inputs (inputs 1) printed first and the multiplexed inputs (inputs 2) printed second. The numerals 1 and 2 are printed in the 14th column (at the extreme left) to identify the inputs. The multiplexed inputs are connected to the printer by means of a separate cable. The multiplex option may be purchased with 11 or 12 digits on inputs 1 and 12 digits on inputs 2.

OPTIONAL INPUT LEVELS

Input levels other than those specified above may be used by removing the jumper on printed circuit boards C1 and C2 (AA to GND) and connecting pin 46 (connector of cable P1) to the voltage level desired for a binary one. The binary zero must be more negative (by at least 6 volts) than the binary one.

It is possible, if the multiplexer option is used, to have one set of input levels for inputs 1 and another set of levels for inputs 2. This is accomplished by removing the jumper on C1 and C2, as mentioned above for inputs 1; removing the jumper on printed circuit board C4 (YY to GND); and connecting pin 59 (connector of cable P2) to the voltage level desired. For inputs 2, again the binary zero must be more negative (by at least 6 volts) than the one.

The chart of figure 1 is provided to aid in determining column-position printout when a model 620 unit is used with a particular Baird-Atomic instrument. For example, the model 620-1, when used with the Baird-Atomic Model 425 Digital Ratemeter, prints out RANGE in column 2, COUNT in columns 4 through 6, CPS or CPM in column 8, and T1 in column 10. Read across for each unit accordingly.

MODEL NO.	COLUMN 14	13	12	11	10	9	8	7	6	5	4	3	2	1	USED WITH B-A MODEL
620-1					TI		CPS or CPM		COUNT				RANGE		425
620-2			TIME or SN						COUNT						530
620-3		SN			TIME					COUNT					563
620-4	SN or PRINT CYCLE			COUNT						COUNT					560 and 560A
620-5	LOWER LEVEL		TIME						COUNT						530-2
620-6	1	0	TIME						COUNT						530 or 140 MULTIPLEXED WITH 144
	2		COUNT						COUNT						
620-7	1		SN		TIME				0	COUNT					563 MULTIPLEXED WITH 144
	2		COUNT						COUNT						
620-8	COUNT				TI		CPS or CPM		COUNT				RANGE		TWO SYNCHRONIZED 425s
620-9			SN		TIME				COUNT						530 USED IN 731 SYSTEM

NOTES

Range - prints number corresponding to the exponent of the selected position of the Range switch 1, 2, 3, etc.
Count - prints numbers corresponding to accumulated count
Time - prints numbers corresponding to elapsed time
CPS, CPM - prints a number 1 for CPS
prints a number 2 for CPM
prints a number 5 for CPS and an error
prints a number 6 for CPM and an error

T1 (Time Interval) - for Model 620-1 and Model 620-8 a number is printed relating to the selected position of the Time Interval switch 1, 2, 3, 4, etc.
SN - indicates the number of the sample associated with the printed elapsed time and count
Print Cycle - indicates number of print cycle; when used in automatic system it is also the sample number
Lower Level - prints a 1 or 2 depending on the alternating baseline position
0 - always prints 0 in position shown

Figure 1. Model 620 Column-Position Printout Chart

SECTION II

OPERATION

INSTALLATION

The paper bale assembly has been firmly secured to avoid damage during shipment. Do not attempt to operate the printer before completing the following (figure 2):

1. Remove the thumbscrew located at the bottom of the front panel.

2. Grasp the printer handle and pull it forward, freeing contact with the printer mechanism housing connector.

3. Remove the mechanism from the housing, tilting it up slightly to clear the housing.

4. Remove the packing material from the paper bale area.

5. Set the printer on a bench or table and depress the print solenoid with a short fast stroke of the thumb. The paper should advance easily and the print should be clear. If the paper or ribbon is jammed, refer to the ribbon and paper loading instructions below.

6. Return the mechanism to the housing, making sure of a positive mate between the mechanism and the housing.

7. Tighten the thumbscrew until the mechanism is securely fastened.

When the printer is used as part of a Baird-Atomic system, mechanical installation and electrical hookup should be in accordance with the procedure set forth in the applicable system manual.

When it is used in its own cabinet for bench-top operation, no precautions are necessary other than those normally taken with commercial laboratory equipment. Plug the line cord into a 3-wire system (third wire ground) to maintain the chassis at the same potential as other equipment.

PAPER LOADING

1. Pull the printer assembly (figure 2) out of its housing until the back plate contacts the stop. Paper may be loaded with the mechanism in this position, or the entire assembly may be removed from the case by pulling it upward and outward in an arc to clear the stop.

2. Snap the chamber latch handle forward approximately 1/8 inch and pull upward to release the chamber lock assembly from the frame.

3. Swing the chamber assembly (figure 3) upward to its horizontal position.

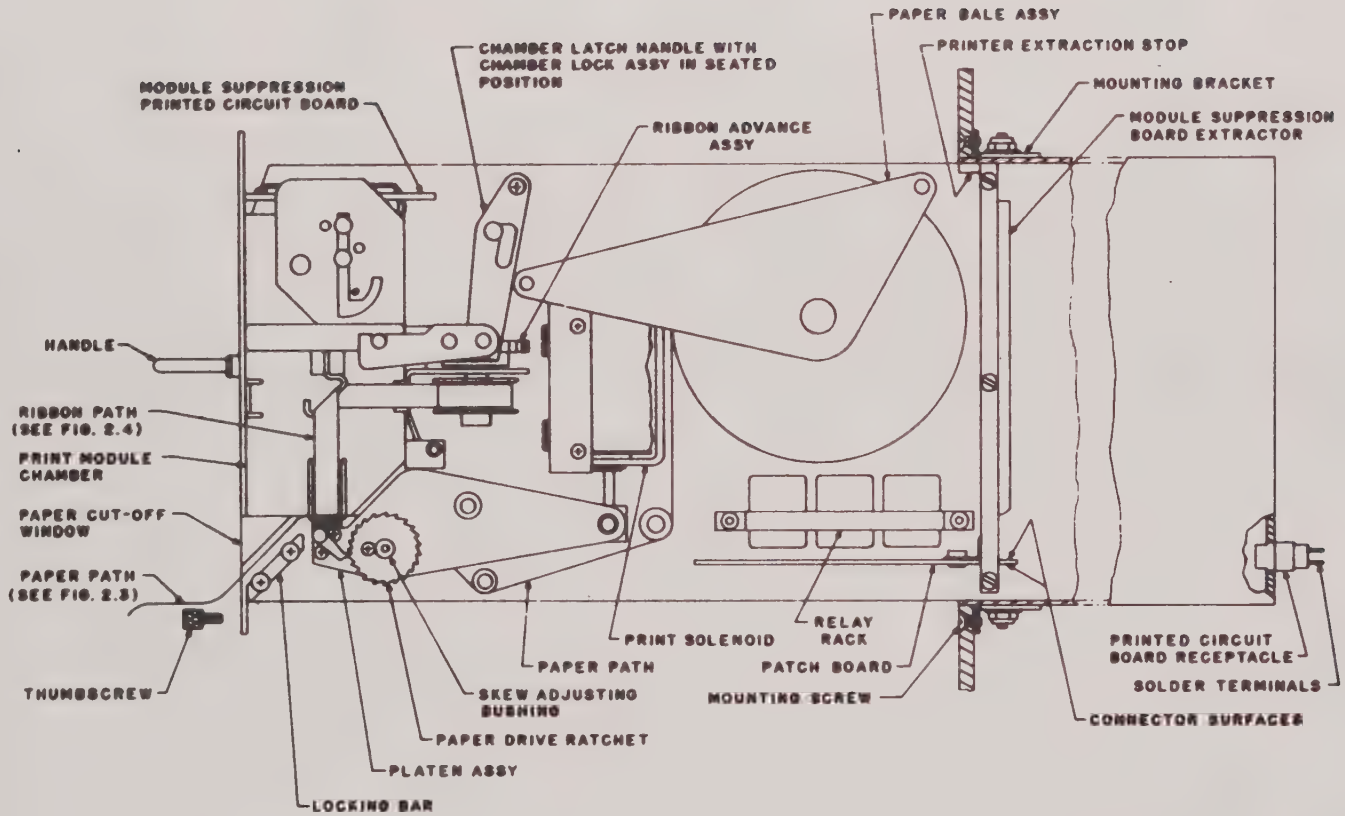

Figure 2. Printer Component Locations

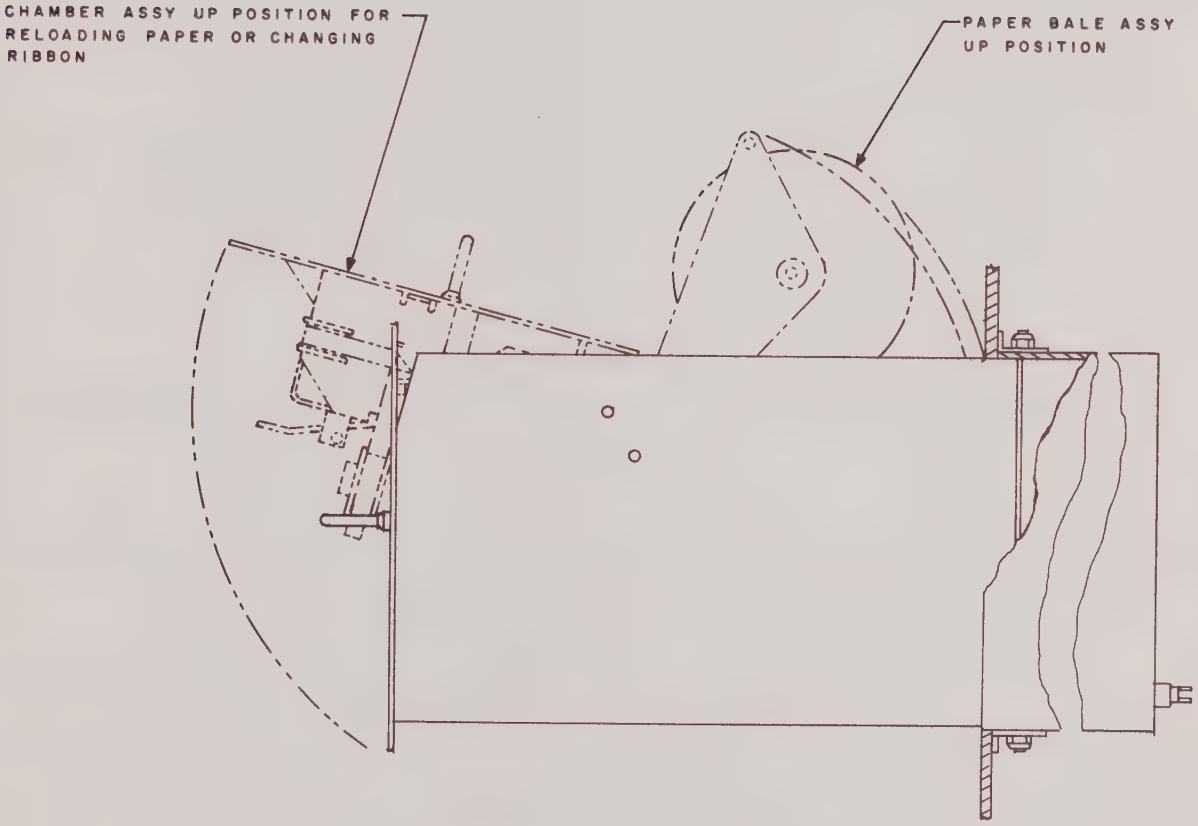

Figure 3. Printer Mechanism Outline

4. Lift the paper roll assembly to the vertical position.

5. Release the paper roll latch. Remove the paper roll shaft and discard the old core.

6. Insert a new roll of paper with the free edge of the paper roll coming off in the direction shown in figure 4.

7. Replace the paper roll shaft, fasten the paper roll latch, and replace the paper roll in the horizontal position.

8. Fold the leading edge of the new paper roll into an arrow shape to facilitate the threading procedure.

9. Thread the paper under the guide shafts, over the paper advance roller, and through the opening in the front panel, as shown in figure 4.

10. Place the chamber assembly in the vertical or closed position, being careful to engage the locking bar with the front panel lip, as shown in figure 2.

11. Lock the chamber assembly in place by pushing the chamber latch handle down and snapping it back into place.

12. Depress and manually release the solenoid a dozen times or more. Make sure that printing and advance occur, indicating that loading is correct.

13. Replace the printer assembly in its case, making sure that the front panel lies flush with the mounting surface.

RIBBON LOADING

1. With chamber assembly in open or horizontal position (figures 3 and 5), remove bobbin retaining knobs.

2. Swing abrasive drive wheel against small-diameter bobbin.

3. Swing detent away to clear and remove large-diameter bobbin.

4. With large-diameter bobbin removed, swing abrasive drive wheel to opposite side.

5. Swing this detent away and remove other bobbin.

6. Install new ribbon by reversing the above procedures.

CONTROLS, INDICATORS, AND CONNECTORS

The pilot light (POWER) and power switch (OFF-STANDBY-ON) are located on the front panel (figure 6). The fuse (F1, 0.75 ampere), line cord, and input cables are located on the rear. Cable P1 is attached to all models, while cable P2 is used only when the multiplex option is desired. With the power switch set to STANDBY, power is removed from the print solenoid and count modules. This prevents printer operation upon receipt of a print command. All other circuits are energized, and the instrument is ready for immediate operation when the power switch is set to ON.

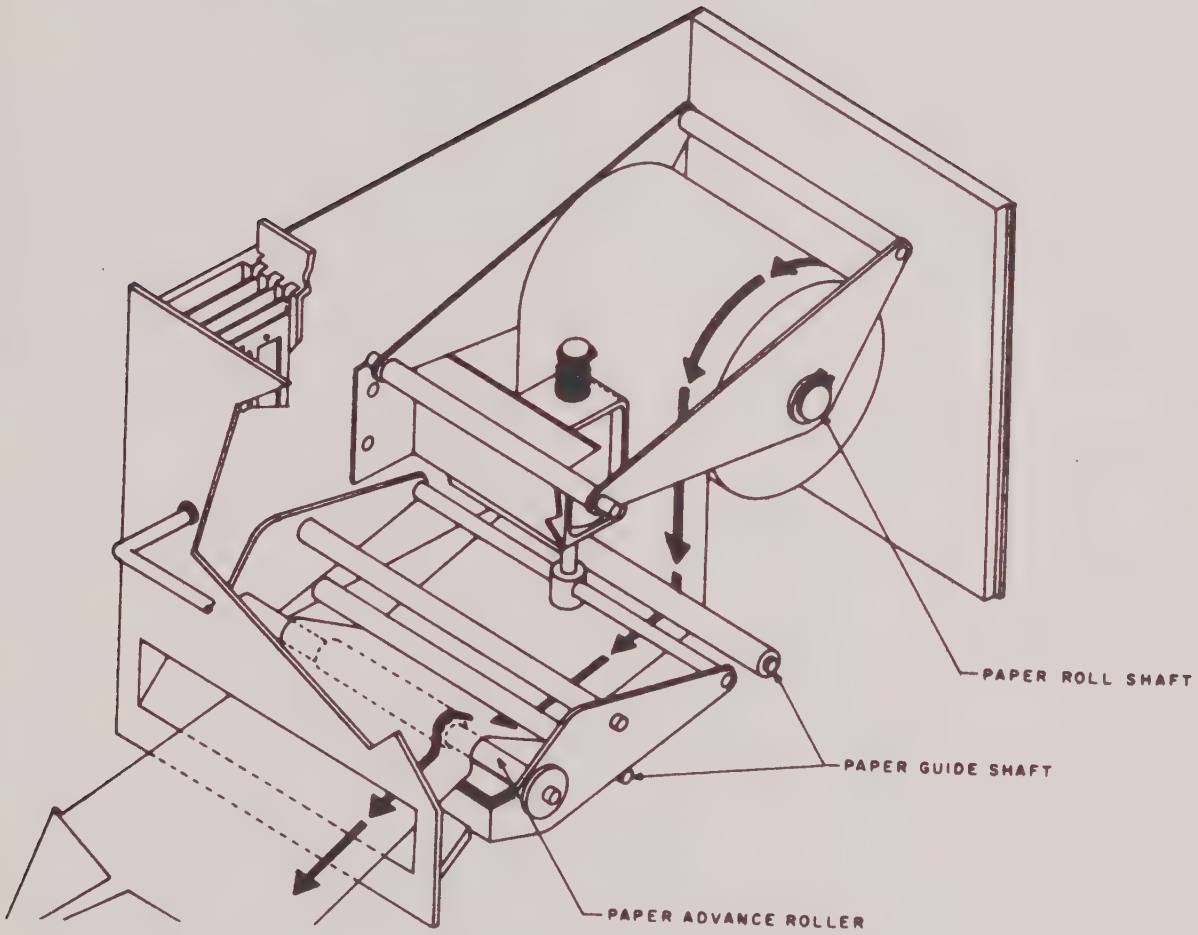

Figure 4. Printer Paper Path

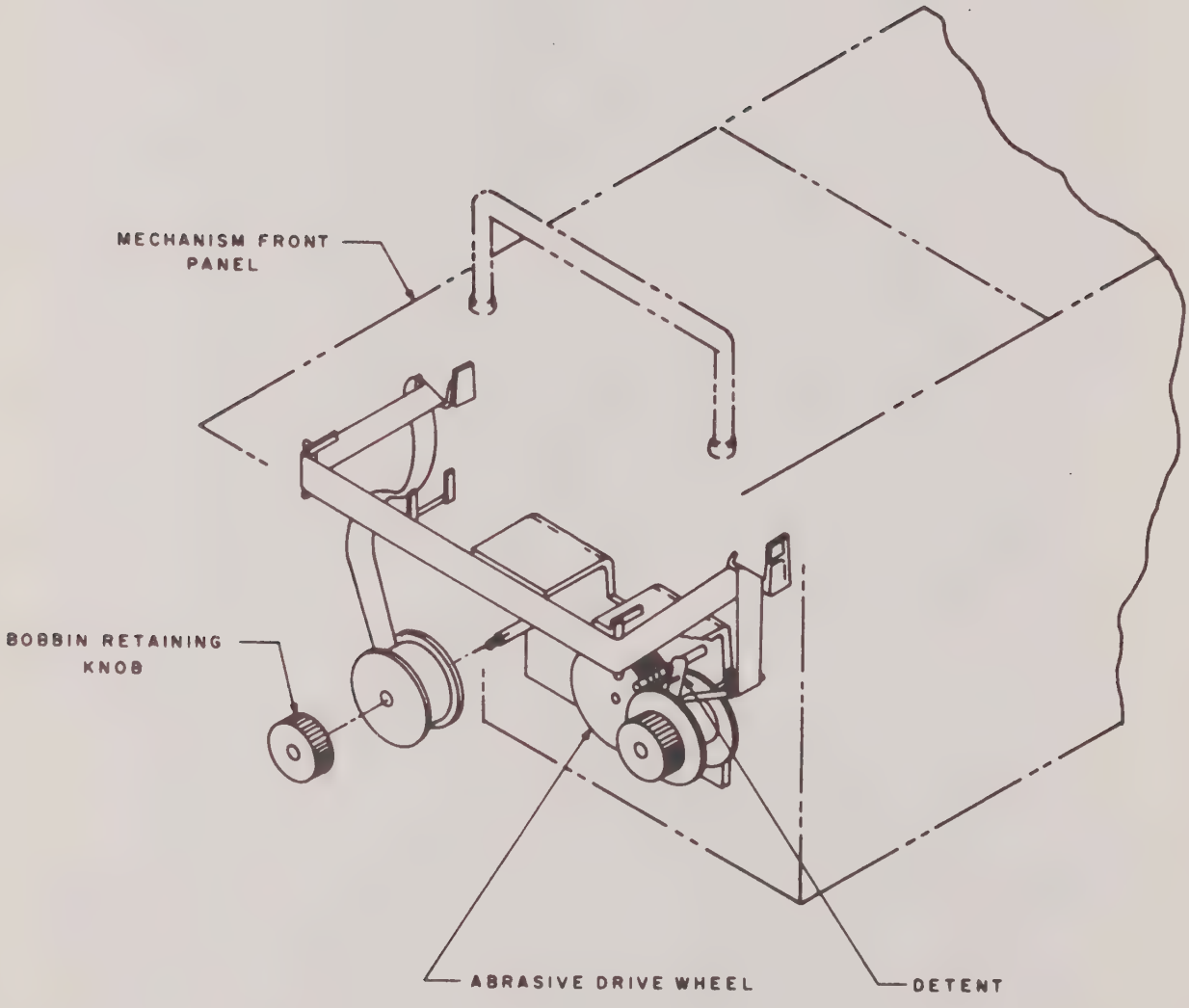

Figure 5. Printer Ribbon Path

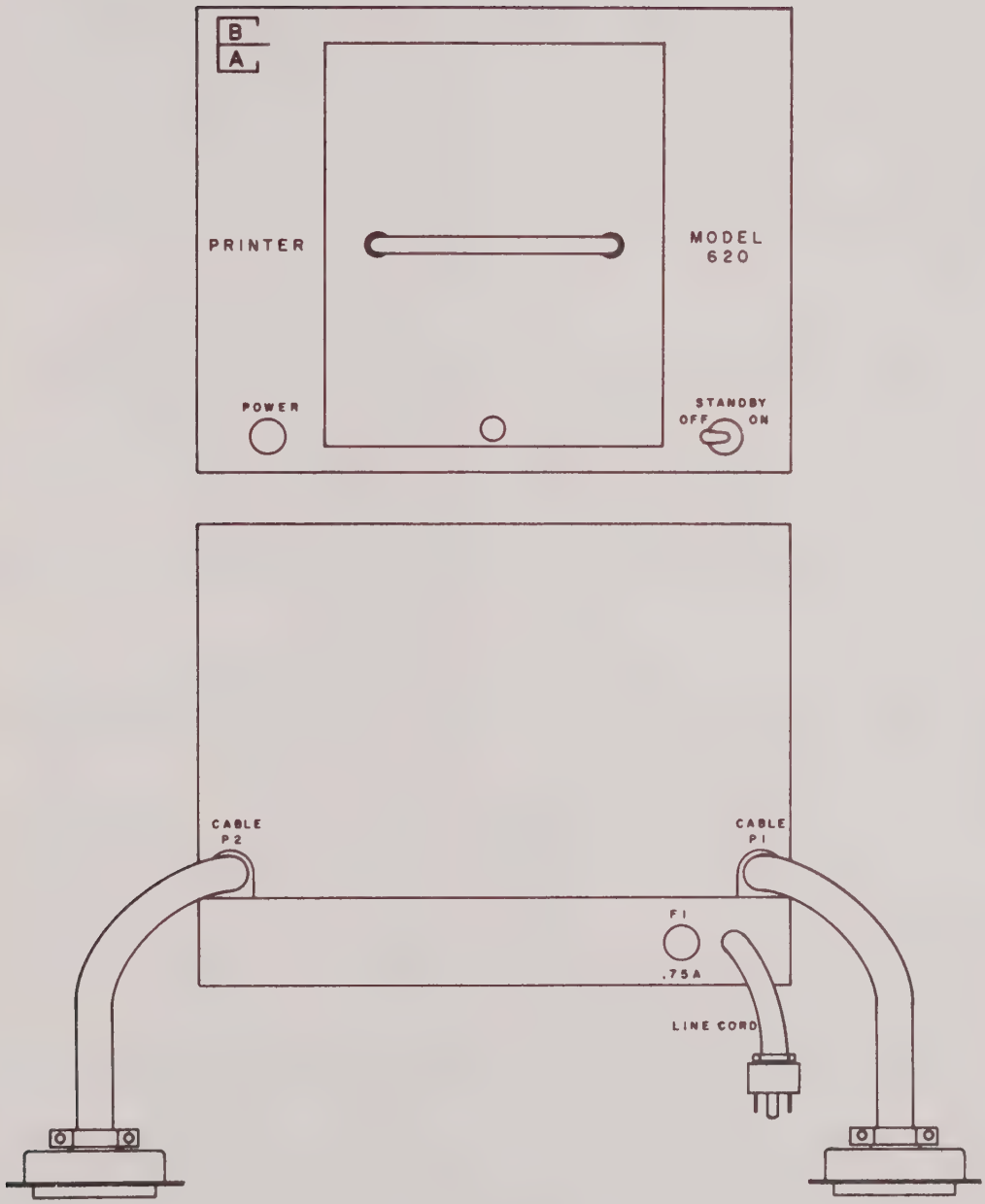

Figure 6. Printer Front and Rear Panels

GENERAL OPERATING PROCEDURES

After the printer mechanism is free to operate, connect input cable P1 to the controlling equipment. This cable (and the type of connector) varies with the model purchased (see chart on figure 7). With the multiplex option, an additional cable, P2, is used to connect to the equipment to be multiplexed. Cable P1 has provisions for accepting four inputs per digit, and also common, inhibit start, signal level, and print command. (The cables associated with models 620-1 and 620-8 do not have inhibit start provisions, for they are used in conjunction with the Model 425 Digital Ratemeter. It is unnecessary for the model 425 to have this feature, since it has buffer storage and recycles from its own internal timer.) The multiplex cable P2 has provision for accepting four inputs per digit (12 digits), and also signal level, inhibit start, and common.

After all interconnections have been made for system hookup, set the power switch to ON. Set up the controlling equipment to apply a print command signal to the printer. Check for proper paper advance and clear, legible characters.

For cases where the printer is to be used with equipments other than those specified in the chart on figure 7, provisions have been made to accept signal levels other than 0 to -6 volts by completing the following:

1. Remove the four chassis mounting screws (they also hold the rubber feet in place).

2. Pull the chassis forward toward the operator.

3. Remove the jumper on PC board C2 and PC board C1 (AA to GND), which allows the signal level on cable P1 to be changed. (See figure 10 in Section IV for PC board locations.)

4. Remove the jumper on PC board C4 (YY to GND), which allows the signal level on cable P2 to be changed.

The signal level wires are brought through the cable to the following connector pins:

pin 46 — models 620-1, -2, -3, -5, -8, and -9

pin 59 — models 620-4, -6, and -7

Connect the appropriate wires to these pins on the controlling and multiplexed systems.

NOTE 1 THE CHART INDICATES COLUMN POSITIONS, PC BOARDS AND CABLES USED WITHIN THE MODEL 620 SERIES.
C5 PATCH BOARD IS JUMPERED ACCORDING TO CHART.

2 INSERT PRINT MODULES IN COLUMNS THAT ARE USED (SEE CHART FOR POSITION INFORMATION).

3 TI (IN CHART) = TIME INTERVAL (SECONDS OR MINUTES); THE CODE IS:
1 = SEC., 2 = MIN., 5 = SEC. & ERROR, 6 = MIN. & ERROR

4 REMOVE GROUND IN MODELS 620-6 AND 620-7 (I.E. WHEN MULTIPLEX CARD C4 IS USED).

CHART

MODEL NO.	COLUMN 14	13	12	11	10	9	8	7	6	5	4	3	2	1	DIGIT BRD	CABLE P1	CODE GEN	MUX BRD	CABLE P2
620-1					TI		CPS		COUNT					RAN	C1	C-32901	C3		
					F		E		D	C	B			A					
620-2				K	J	I	H	G	F	E	D	C	B	A	C1 & C2	C-32902	C3		
				TIME					COUNT										
620-3		(SN)			TIME				COUNT						C1 & C2	C-32902	C3		
		K	J		I	H	G	F		E	D	C	B	A					
620-4		(SN)			COUNT				COUNT						C1 & C2	C-32905	C3		
		L	K		J	I	H	G	F	E	D	C	B	A					
620-5		(0-11)			TIME				COUNT						C1 & C2	C-32902	C3		
		L	K	J	I	H	G		F	E	D	C	B	A					
620-6	(1)	(0)			TIME				COUNT						C1 & C2	C-32902	C3	C4	C-32906
	N	L	K	J	I	H	G		F	E	D	C	B	A					
	(2)				COUNT				COUNT								C3	C4	
	N	L	K	J	I	H	G		F	E	D	C	B	A					
620-7	(1)		(SN)		TIME			(0)	COUNT						C1 & C2	C-32902	C3	C4	C-32906
	N		L	K	J	I	H	G	F	E	D	C	B	A					
	(2)				COUNT				COUNT								C3		
	N		L	K	J	I	H	G	F	E	D	C	B	A					
620-8	COUNT				TI		CPS		COUNT					RAN	C1 & C2	C-32904	C3		
	J	I	H		F		E		D	C	B			A					
620-9			(SN)		TIME				COUNT						C1 & C2	C-32903	C3		
			K	J	I	H	G		F	E	D	C	B	A					

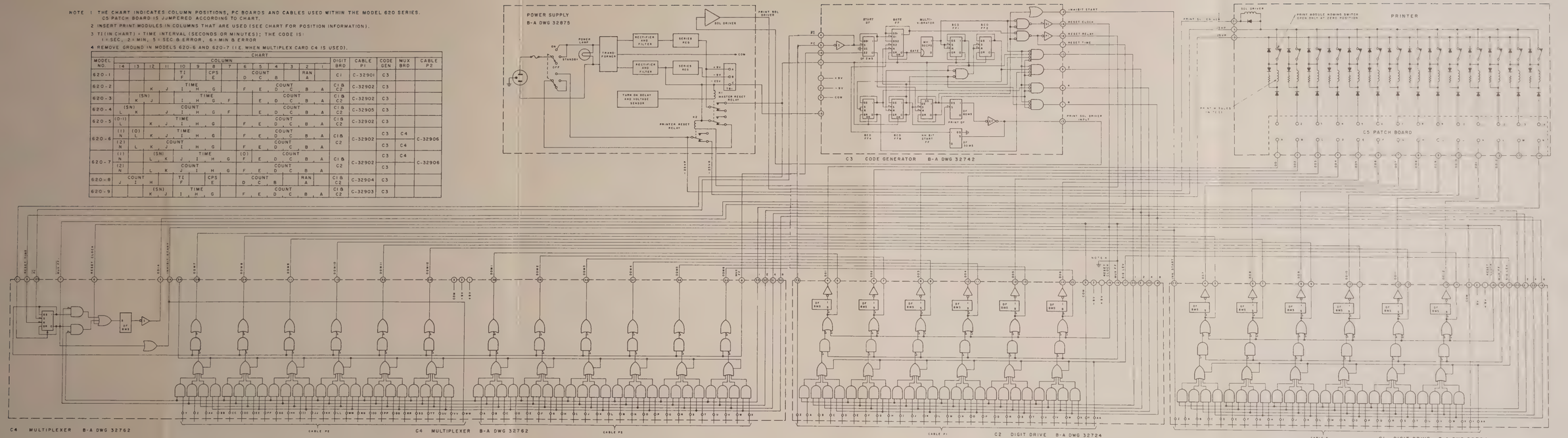
POWER SUPPLY
B-A DWG 32875
C3 CODE GENERATOR B-A DWG 32742
C5 PATCH BOARD
PRINTER
C4 MULTIPLEXER B-A DWG 32762
C4 MULTIPLEXER B-A DWG 32762
C2 DIGIT DRIVE B-A DWG 32724
C1 DIGIT DRIVE B-A DWG 32724

Figure 7. Model 620 Printer Logic Diagram

SECTION III

PRINTER THEORY

GENERAL

All components necessary to perform printout functions are included in the Model 620 Printer. Figure 7, the overall printer logic diagram, illustrates functional relationships.

POWER SUPPLY

The system supply provides reliable operation over a wide range of ambient and line conditions. Using a constant-voltage ferroresonant transformer, the supply offers fast line regulation, short-circuit protection, automatic current limiting, and increased reliability.

The basic supply consists of a full-wave capacitor input circuit. The transformer, a constant-voltage device, provides for 1 percent regulation of the raw supply over all normal line variations. For those circuits requiring a higher degree of regulation and isolation, additional regulators have been incorporated to provide −9 and +9 volts.

Relays K101 and K102 are also associated with the main power supply. K102, the printer reset relay, is energized during module reset time, removing the −25-volt supply from the printer solenoids. A parallel path to the solenoid exists through the interrupting contacts which open up when the module wheel reaches zero position. K101, the master reset relay, conditions the code generator logic when power is first turned on. It also acts as a protective device, removing the −25-volt supply from the module drivers if the +9-volt supply fails.

CODE GENERATOR C3

The function of the code generator circuits is to program the BCD 4-line input levels into printer module wheel positions, inhibit system operation during setup time, and in proper sequence direct the printout of characters relative to the module wheel positions.

DIGIT DRIVE C1 AND C2

The digit drive circuits are used to gate the 1, 2, 4, and 8 clock line outputs of the code generator with the BCD input gating levels, selecting the number of pulses necessary in rotating each print module wheel to the character position represented by the input. Since the input accepts parallel entry, all print modules representing each column of print are simultaneously selected. Gating provisions have been included to select inputs 1 and inputs 2 in sequence when the multiplex feature is used. An 8-millisecond delay flop is used to turn on the print module drivers once for each character position.

MULTIPLEX C4

The multiplex circuits, like those of the digit drive, gate the 1, 2, 4, and 8 clock line outputs from the code generator with the BCD input levels (2), selecting the number of pulses necessary in rotating each print module wheel to the character position represented by inputs 2. The driving pulses are brought out and gated to their respective print module drivers.

Additional logic circuits are provided to supplement the code generator when multiplexing is used. This includes gating of the inhibit start line, initiating a second print cycle, and an extra module driver which codes column 14 with a number indicating whether inputs 1 or inputs 2 have been read out.

PATCH BOARD C5

The patch board wiring varies with the model purchased; it is easily accessible, so that any input digit position can be connected to any column position.

PRINTER DIODE BOARD

These circuits contain diodes and resistors used as suppression networks across the print module coils.

CIRCUIT FUNCTIONS

This discussion is based on a 12-digit multiplexed system, incorporated, for example, in models 620-6 and 620-7. Figure 8 is a detailed timing diagram of one complete print cycle; figure 9, while not so detailed, incorporates the additional timing necessary when multiplexing two sets of inputs.

The total time for printing out one set of inputs is 492 milliseconds, as shown in figure 8. At time t6 a second cycle is initiated by the multiplex logic to accommodate inputs 2 of the multiplex system. This cycle is identical in timing sequence to that in printing out inputs 1. When multiplexing is not used, the inhibit start line is enabled at time t3 (192 milliseconds). With the multiplex feature, the inhibit start line is gated with the mux flip-flop, preventing the external equipment from accepting new information until time t8 (684 milliseconds), as shown in figure 9.

A negative-going print command received by the code generator at time t0 (figure 8) is inverted and used to trigger the 2-millisecond start delay flop and condition the mux flip-flop. This flip-flop enables inputs 1 (cable P1) to be processed on the first print cycle and inputs 2 (cable P2) on the second. The zero side of the 2-millisecond delay flop immediately resets the inhibit start delay flop, the output of which is gated and used to prevent further accumulation of data in the external system. It also enables the print delay flop and the 1, 2, 4, 8 line output gates.

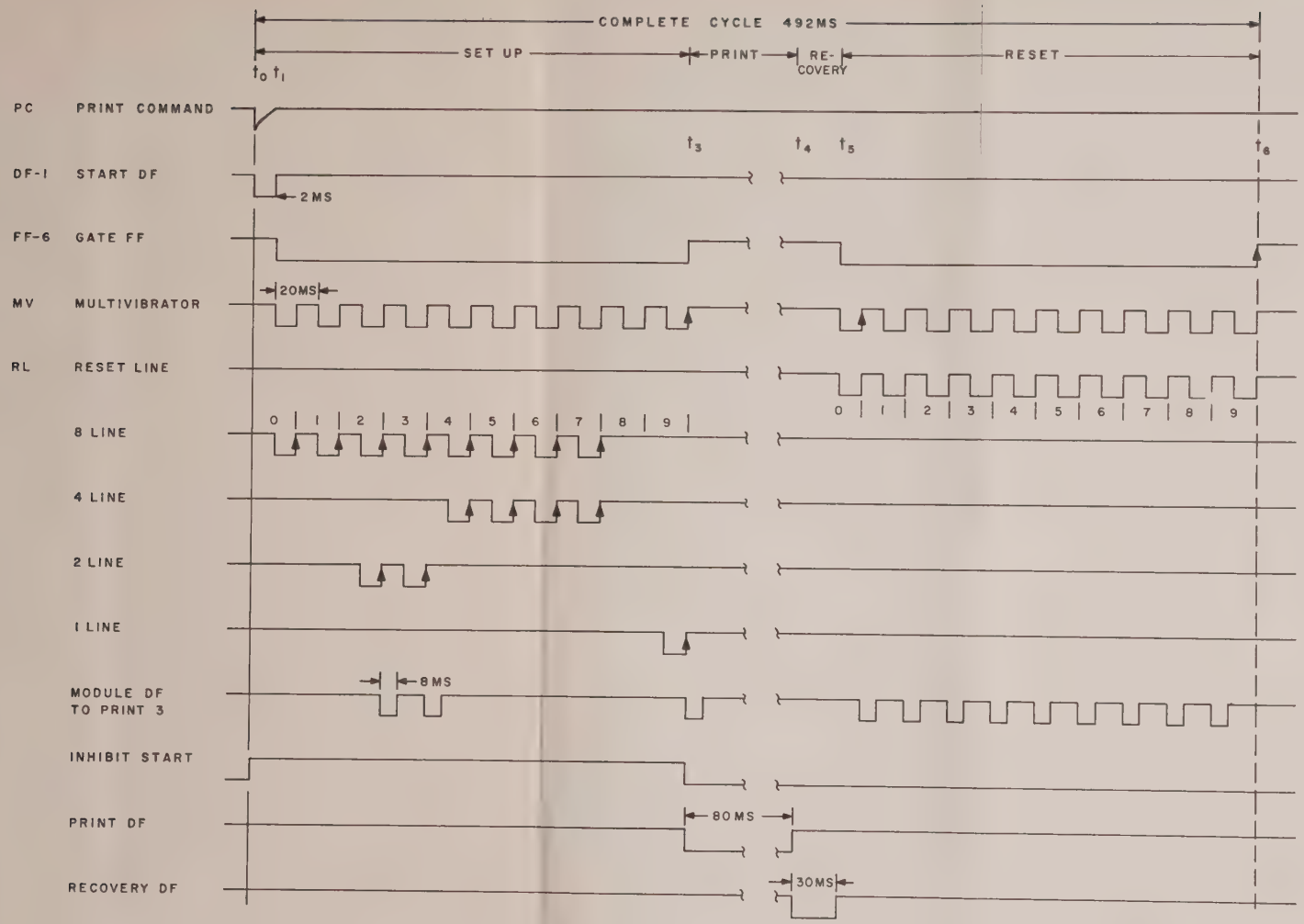

Figure 8. Detailed Timing Diagram of One Complete Print Cycle

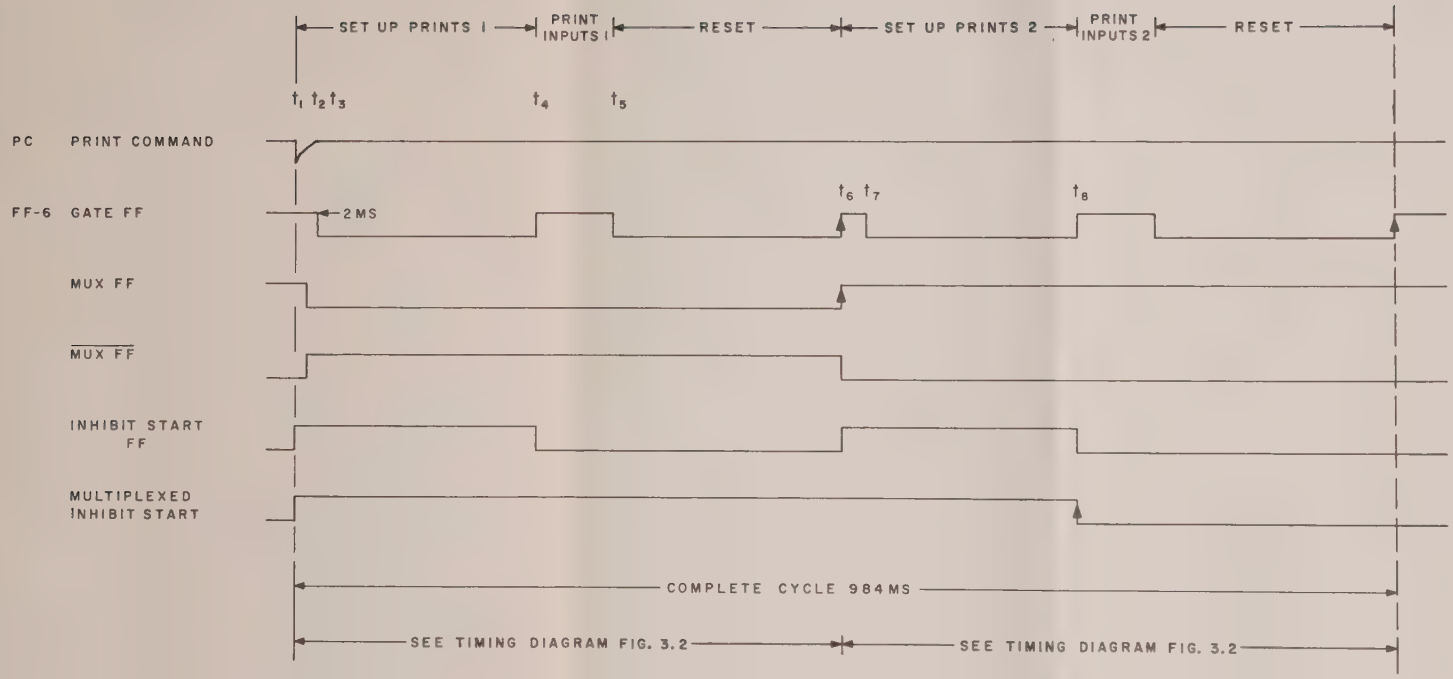

Figure 9. Printer Timing Diagram with System Multiplexed

At the end of the 2-millisecond delay (t1) the positive-going edge of the 1 side sets the gate flip-flop, enabling the clock multivibrator. The positive edge of the multivibrator is used to drive a divide-by-10 BCD decade. The 1, 2, 4, 8 line outputs of the decade are gated and connected to the digit drive boards through appropriate connectors. The signal inputs 1 associated with cable P1 are also brought into the digit drive boards, where the 1, 2, 4, 8 lines of each digit are gated with the 1, 2, 4, 8 line output of the divide-by-10 decade. The number of pulses passing through each gate is dependent on their respective input levels, which represent a character to be printed. Each pulse that is allowed to pass triggers an 8-millisecond driver delay flop.

The output of the delay flop is power-amplified and applied to the print module coil. When the coil is energized, the print module wheel rotates to the next character position. If, for example, the preceding gates had allowed four pulses to get through, the print module coil would be energized four times, placing the print module wheel in a position allowing a number 4 to be printed. Since the input signals are programmed in parallel, all of the columns are set up at the end of the 10th pulse from the clock multivibrator.

At time t3, when the 10th clock pulse is going positive, the BCD decade resets the gate flip-flop and sets the inhibit start flip-flop. The 0 side of the gate flip-flop disables the clock multivibrator, while the BCD 8 flip-flop triggers the 80-millisecond print delay flop. The print delay flop output is connected to the print solenoid through a buffer and a power driver stage. When the solenoid is energized, the printer platen is brought in contact with the characters on the print module wheels, imprinting on paper tape the character representative of the input signal.

At the end of 80 milliseconds (t4), the 1 side of the print delay flop sets a 30-millisecond recovery delay flop and also de-energizes the print solenoid. This recovery delay flop provides time for the printer platen to move away from the module wheels before reset action is started. When the recovery delay flop goes positive (t5), the gate flip-flop is again set, enabling a new train of pulses from the clock multivibrator. Since the inhibit start flip-flop is now in the set condition, the 1, 2, 4, 8 line gates are disabled, preventing an output to the digit drivers. At time t3, when the inhibit start flip-flop was set, the 1 side enabled the reset relay and reset clock gates, connecting subsequent clock pulses directly to the printer module drivers. At time t5 the reset relay gate energizes the reset relay, interrupting the -25-volt line in series with the printer module coils. However, a parallel path exists to the coils through the mechanical reset contacts mounted on each individual module wheel.

These contacts open up when the wheel traverses the position significant to the character zero. This prevents any further rotation of the wheel with subsequent clock pulses. Since the pulses are sufficient in number, any character position will be reset to zero. At time t6 the gate flip-flop is reset by the BCD 8 flip-flop, but the printer delay flop has been disabled, preventing the

energizing of the print solenoid. The clock multivibrator is disabled, and the printer assumes the same condition that existed when a print command was first received. If the multiplex feature were not used, the printer would remain in this condition waiting for a new command.

With the multiplex option, the output of the reset relay gate resets the mux flip-flop, initiating a new print cycle. This flip-flop also enables the gating of inputs 2 with the code generator 1, 2, 4, 8 line output in determining print module wheel positions. The outputs of these gates are brought to the digital drive board and connected to the 8-millisecond digit drive delay flops. Inputs 1 are disconnected by gating with the mux flip-flop. The setup and printout of inputs 2 is identical to that of the inputs 1. At time t8 the inhibit start line is enabled, permitting the controlling system to accumulate new information.

The multiplex board also contains an additional digit drive delay flop and driver used for coding column 14 with a character 1 or 2, denoting the line to be associated with inputs 1 or inputs 2. The condition of the mux flip-flop gates the 1 and 2 line outputs of the BCD decade in proper sequence.

The patch board located under the printer mechanism is connected differently for different models (see chart on figure 7). These jumpers can be relocated to obtain digit-to-column positions as desired, provided the count modules are correspondingly relocated.

COUNT MODULE

The count module solenoid is actuated by the digit driver through appropriate cables to the printer. When energized, the coil attracts an armature which drives an escapement against a star. The star is integral with and partially recessed into the number wheel. Single digit advances occur in successive, approximate half steps as the module is repeatedly pulsed and released. Maximum leverage, coupled with a narrow gap between armature and laminations, produces high response times and speed. This geometry, combined with minimal mass, creates substantial economies in the consumption of current.

On the other side of the wheel are recessed cams that actuate a control switch which opens at zero. Electrical connections are made to the modules with standard plug-in pins. The module suppression board is designed to fit over these pins, making proper contact for each module.

SECTION IV

MAINTENANCE

GENERAL

The simplicity of the Model 620 Printer mechanism lends itself to long-lasting operation without the need for adjustments or lubrication. If a malfunction occurs in the main printer mechanism, return it to the factory. Problems that arise with the count modules can easily be corrected by replacing the module. Printed circuit board locations are shown in figure 10.

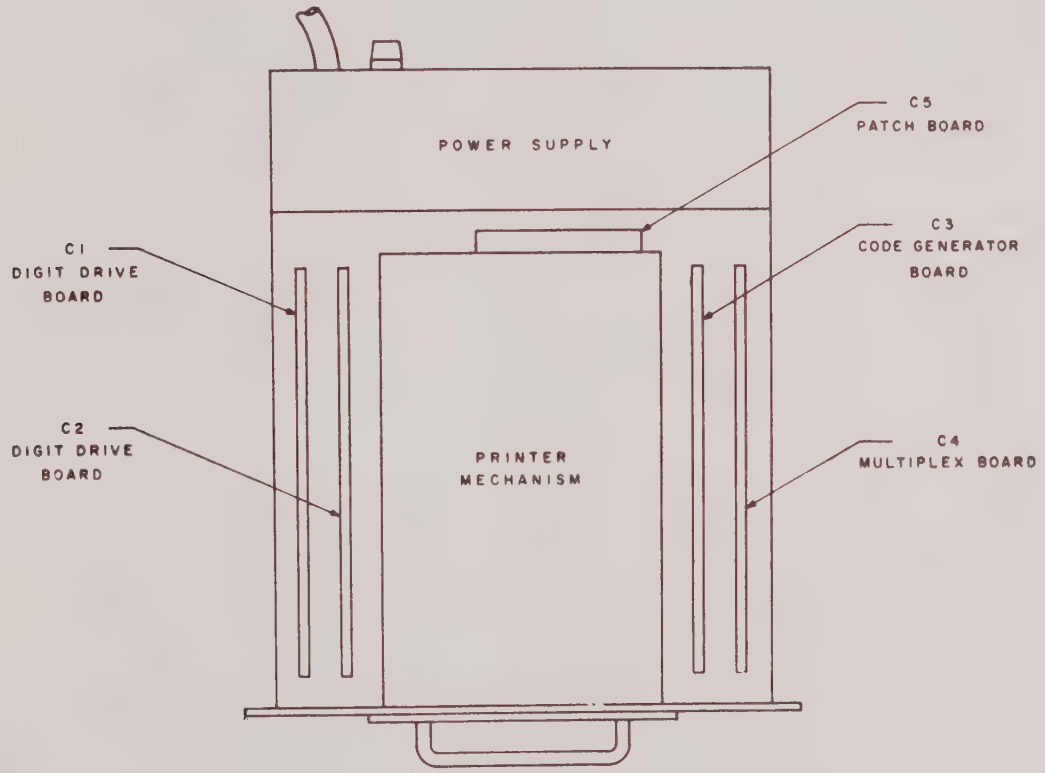

Figure 10. Printed Circuit Boards, Top View

TROUBLESHOOTING

The printer is designed for long, trouble-free operation. Worst-case end-of-life parameters were considered in equipment design, derating where necessary to ensure operation under wide environmental conditions. Troubleshooting is facilitated by printed circuit boards that are easily accessible. Extender boards are available to make test connections to the components. The printer may be taken from its cabinet by removing the four chassis mounting screws (which also hold the rubber feet in place) and sliding it forward.

If problems appear in the printer, refer to Sections II and III for guidelines. Apply a command signal and trace it through, using figures 7 through 9 to isolate and clarify technical problems.

If a trouble cannot be easily located and corrected, contact the nearest Baird-Atomic office.

SECTION V

PARTS LIST

All Model 620 Printer basic components and those of the other printers (models 620-1 through 620-9) discussed in this manual are listed below. Reference designations appear schematically on drawings D-32920 and C-32875, included with this manual. The reference designations identify electrical/electronic component parts referenced in drawings or text; mechanical parts which are not likely to require replacement during normal printer service life are not included in this parts list. For easy location, all items given a reference designation in the parts list are arranged in alphanumerical order. Exact printer panel stamping, when it exists, is reproduced in the NAME OF COMPONENT AND DESCRIPTION column. Those few items listed without an assigned reference designation are included last in alphabetical order.

COMPONENTS COMMON TO PRINTERS 620-1 THROUGH 620-9

Ref. Desig.	Name of Component and Description	Part Number
C101	Capacitor, 100μf, 50 volts	00549
C102	Capacitor, 10,000 μf, 50 volts	30354
C103	Capacitor, 50 μf, 16 volts	32878
C104	Capacitor, 5 μf, 50 volts	09580
CR101 and CR102	Diode, CER 69	00840
CR103 and CR104	Diode, 200 DSR	30360
CR105 and CR106	Diode, IN935	30359
CR107 and CR108	Diode, S706G	31147
DS1	Pilot lamp	30497
F1	Fuse, 0.75 amp, SLO-BLO	00713
K101 and K102	Relay, 4PDT	32870
Q101	Transistor, 2N697	32923
Q102 and Q104	Transistor, 2N1545	21234
Q103	Transistor, 2N2000	30312
R101	Resistor, 150 ohms, 1/2 watt, ±5%	00062
R102	Resistor, 1.3k, 1/2 watt, ±5%	00112
R103	Resistor, 820 ohms, 1/2 watt, ±5%	00101
R104	Resistor, 5 ohms, 5 watts, ±10%	32926
R105	Resistor, 13k, 1/2 watt, ±5%	00364
R106	Resistor, 8.2k, 1/2 watt, ±5%	00374
R107	Resistor, 75k, 1/2 watt, ±5%	00324
R108	Resistor, 47 ohms, 1/2 watt, ±5%	00035

COMPONENTS COMMON TO PRINTERS 620-1 THROUGH 620-9 (Cont.)

Ref. Desig.	Name of Component and Description	Part Number
S1	OFF-STANDBY-ON, toggle switch, 2-pole, 3-position	30619
T101	Transformer	32898
	Cabinet (including stand)	32965
	Connector, 23-pin	30289
	Connector, 41-pin	30852
	Instruction manual	32924
	Print module	32887
	Thumbscrew, 6—40 x 1/2 inch long	32967

BOARDS AND CABLES*

Ref. Desig.	Name of Component and Description	Part Number
C1 andC 2	Digit drive board	32896
C3	Code generator board	32897
C4	Multiplexer board	32895
P1	Cable	32901
		32902
		32903
		32904
		32905
P2	Cable	32906

*For board and cable usage see figure 7.

APPENDIX

MODEL 620 PRINTER SCHEMATIC AND CABLE DRAWINGS

Dwg. No.	Name
D-32724	Digit Drive
D-32742	Code Generator
D-32762	Multiplexer
C-32875	Power Supply
C-32901	Cable
C-32902	Cable
C-32903	Cable
C-32904	Cable
C-32905	Cable
C-32906	Cable
D-32920	Logic Diagram

BAIRD-ATOMIC

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